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06ME56

Fifth Semester B.E. Degree Examination, December 2010
Engineering Economics

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer any FIVE full questions, selecting at least TWO questions from each part.***
2. Use of discrete interest factor table is permitted.

PART – A

1 a. Briefly explain the problem solving process, with a diagram. How are the decisions taken? **(06 Marks)**

b. Briefly explain the law of demand and the law of supply. **(06 Marks)**

c. A person is planning for his retired life. He has 15 more years of service. He would like to deposit 20% of salary, which is Rs.15000 at the end of 1st year and thereafter he wishes to increase his deposit by Rs.2500 more every year along with Rs.15000 for the next 14 years. What will be the maturity amount of this deposit, if the interest rates are 10% and 14% per year? **(08 Marks)**

2 a. Briefly explain the conditions for present worth comparisons. **(06 Marks)**

b. A company is considering two machines having same capability and satisfactory function. Machine A has a first cost of Rs.500000 and has no salvage value at the end of 6 yrs of useful life and operating costs of Rs.200000 per year. Machine B costs Rs.900000 and has an expected salvage value (resale) of Rs.225000 at the end of 9 yrs of useful life, operating costs of Rs.225000 per year. Compare the two alternatives on the basis of their present worth, using repeated projects assuming 10% annual interest rate. **(08 Marks)**

c. A company is planning to buy an inspection and measuring device for Rs.450000. The expected life of the device is 6 years and expected annual operating costs and taxes are Rs.60000 for the first year with additional increase of Rs.10000 per year thereafter till 5 years. Maintenance costs will be zero due to warranty and are expected to be Rs.100000 for year 3 and Rs.50000 increase per year, thereafter in addition to third year maintenance cost. What is the minimum desired annual economic benefit of the device assuming that these benefits will just offset the annual costs? Company uses an interest rate of 10% for economic evaluation. **(06 Marks)**

3 a. A mining an excavating company uses a large number of light pick up trucks for crew transport and general utility duties. The truck has a first cost of Rs.190000 and owing to generally rough use, loose value at a rate approximately 30% of current value of asset per year. Operation and maintenance cost for two shift use amounts to Rs.40000 for the first year and increase about Rs.8000 per year for each additional year of service. Current company policy is to keep the vehicle for 5 years before they are sold. The maintenance supervisor has suggested that they be sold one year earlier in order to reduce maintenance expenses. Using an interest rate of 12%, determine equivalent annual cost effect of implementing the supervisor's suggestion. **(08 Marks)**

b. An electric utility company is looking at two alternatives for three trimming equipment. One is to subcontract to an independent company. The subcontractors bid calls for Rs.980000 for the first year with additional costs of Rs.80000 per year for subsequent years. The utility company is considering buying equipment with a first cost of Rs.2200000 and annual operating expenses of Rs.650000 per year. The equipment is expected to have a salvage value of Rs.250000 at the end of its useful life (to utility company) of 5 years. Using an interest rate of 12%, evaluate the alternatives on EAC basis and suggest the best one. **(07 Marks)**

c. A city maintenance crew has experienced with a conventional machine that suggest that its service life 6 years. A newly designed machine costs 50% more than the conventional machine but easier in operation, which will make it more adaptable to residential lanes. Both machines will have the same operating costs and salvage values are expected to be negligible. What will be the service life of newly designed machine to make its costs comparable to that of conventional machine at i = 10%? **(05 Marks)**

4 a. A company is in the process of selecting the best alternative among the following three mutually exclusive alternatives. Find the best alternative based on rate of return (calculation) comparisons. **(10 Marks)**

Alternative	Initial investment	Annual revenue	Life in years
A_1	Rs.50,00,000	Rs.10,00,000	10 years
A_2	Rs.80,00,000	Rs.14,00,000	10 years
A_3	Rs.40,00,000	Rs.8,25,000	10 years

4 b. A car was purchased for Rs.4,00,000 and salvage value was estimated as Rs1,00,000 at the end of 8 years of useful life. Calculate the book value of the car at the end of 5th year by declining balance method and straight line method of depreciation. Also find the accumulated depreciation at the end of 6th year by declining balance method and sum of the years digit method of depreciation. **(10 Marks)**

PART – B

5 a. Briefly explain the contents of elements of cost. **(06 Marks)**

b. A product XYZ manufactured in a small scale industry has the following details: Variable overheads = Rs.25/- per unit, fixed overheads = Rs.60000 per month, units manufactured = 60000 units per month. Find : i) The normal overhead cost per unit, ii) IF production drops to 80%, find overhead charges per unit and iii) If production increases to 120%, find overhead charges per unit corresponding to above description. **(08 Marks)**

c. MICO factory produces 6000 spark plugs per day involving a direct material costs of Rs.500000. Direct labour cost of Rs.400000 and factory overheads of Rs.150000. Assume a profit of 20% of selling price and selling overheads are 30% of factory costs. Calculate the selling price of each sparkplug. **(06 Marks)**

6 a. What are the objectives of financial statements? **(05 Marks)**

b. From the following trial balance of M/s Sri Ram & Co., for the year ending 31st March 2005, prepare a trading account, profit and loss a/c and balance sheet.

	Rs. (in '000)		Rs. (in '000)
Stock on 1st April 2004	500	Return outwards	250
Bill receivable	2250	Trade expenses	100
Purchases	19500	Office furniture	500
Wages	1400	Cash in hand	250
Insurance	550	Cash at bank	2375
Sundry debtors	15000	Rent and taxes	550
Carriage inwards	400	Carriage outwards	725
Commission (Dr)	400	Sales	25000
Allow interest on capital	350	Bills payable	1500
Stationary	225	Creditors	9825
Return inwards	650	Capital	8950
Commission (Cr)	200		

Closing stock was valued at Rs.12,500,000 as on 31st March 2005. **(15 Marks)**

7 a. Briefly explain atleast three ratios coming under following headings:
i) Liquidity ratios ii) Leverage ratios iii) Profitability ratios. **(10 Marks)**

b. Jai Hind Company has made plans for the next year. It is estimated that the company will employ total assets of Rs.8,00,000. 50% of the assets are financed by borrowed capital at an interest rate of 8 percent per year. The direct costs for the year are estimated at Rs.4,80,000 and all other operating expenses are estimated at Rs.80000. The goods will be sold to customers at 150 percent of direct costs. Tax rate is assumed to be 50 percent. You are required to calculate : i) Gross profit margin, ii) Net profit margin , iii) Return on assets, iv) Assets turnover and v) Return on owners equity. **(10 Marks)**

8 a. What are the objectives of profit planning? **(08 Marks)**

b. Draw a flexible budget for the overhead expenses on the following data and determine the overhead rate at 70%, 80% and 90% plant capacity. **(12 Marks)**

Particulars	Plant capacity (80%)
Variable overheads :	
Indirect labour	Rs. 1,25,000
Stores including spares	45,000
Semi variable overheads :	
Power (50% fixed)	2,25000
Repairs and maintenance (60% fixed)	20,000
Fixed Overheads:	
Depreciation	1,20,000
Insurance	35,000
Salaries	1,25,000
Estimated labour hours	1,60,000 hours

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